

CLAIMS

1. An internal explosion engine and generator, comprising an explosion chamber, a movable member forming one wall of the chamber, a charge of air sealed inside the chamber, means for repeatedly igniting the air in the chamber in an explosive manner to drive the movable member from a position of minimum volume to a position of maximum volume, means for returning the movable member from the position of maximum volume to the position of minimum volume, and means coupled to the movable member for providing electrical energy in response to explosion of the air.
2. The engine and generator of Claim 1 wherein the movable member is a piston.
3. The engine and generator of Claim 2 wherein the means for returning the movable member to the position of minimum volume comprises a flywheel on a crankshaft connected to the piston.
4. The engine and generator of Claim 3 wherein the means for providing electrical energy comprises a generator connected to the crankshaft.
5. The engine and generator of Claim 1 wherein the means for returning the movable member to the position of minimum volume includes a second explosion chamber having a movable member connected to the first named member, a charge of air sealed inside the second chamber, and means for igniting the air in the second chamber in an explosive manner.
6. The engine and generator of Claim 1 including a hermetically sealed housing enclosing the explosion chamber and preventing loss of the air from the chamber.

7. The engine and generator of Claim 1 wherein the movable member is fabricated of a ferro-magnetic material, and the means for providing electrical energy includes a coil which is coupled magnetically to the movable member.

8. The engine and generator of Claim 1 wherein the means for igniting the air includes means for applying RF energy to the chamber to ionize the air and form a plasma, and means for igniting the plasma.

9. The engine and generator of Claim 8 including electrodes in the chamber for heating the ionized air.

10. The engine and generator of Claim 1 including a valve communicating with the chamber for replenishing the air in the chamber.

11. The engine and generator of Claim 10 wherein the valve is a check valve which admits additional air into the chamber when the pressure in the chamber drops below a predetermined level.

5 12. An internal explosion engine and generator, comprising a cylinder, a piston movable within the cylinder to form an explosion chamber of variable volume, a charge of non-combustible gas sealed within the chamber, means for periodically, explosively igniting the non-combustible gas in the chamber to drive the piston between positions of minimum and maximum volume, a crankshaft driven by the piston, and a generator connected to the crankshaft for providing electrical energy in response to movement of the piston.

13. The engine and generator of Claim 12 wherein the non-combustible gas is selected from the group consisting of air, inert gas, and combinations thereof.

14. The engine and generator of Claim 12 including a flywheel on the crankshaft.

15. The engine and generator of Claim 12 wherein the means for igniting the non-combustible gas includes means for applying RF energy to the chamber to ionize the gas and form a plasma, and means for igniting the plasma.

16. The engine and generator of Claim 15 including a magnetically actuated switch responsive to the position of the piston for delivering the spark when the piston is at or near the minimum volume position.

17. The engine and generator of Claim 12 including a valve communicating with the chamber for replenishing the gas in the chamber.

18. The engine and generator of Claim 17 wherein the valve is a check valve which admits additional gas into the chamber when the pressure in the chamber drops below a predetermined level.

19. The engine and generator of Claim 12 wherein the piston is fabricated of ferro-magnetic material and is coupled magnetically with a coil disposed outside cylinder.

20. The engine and generator of Claim 12 including means for energizing the generator as a motor for moving the piston to start the engine.

5 21. An internal explosion engine and generator, comprising a cylinder, a pair of pistons connected together for movement in concert within the cylinder to form a pair of explosion chambers of variable volume, a charge of non-combustible gas sealed within each of the chambers, means for alternately igniting the non-combustible gas in the two chambers in an explosive manner to drive the pistons between positions of minimum and maximum volume, a magnet coupled to the pistons movement with the pistons, and a coil positioned outside the cylinder near the magnet for producing electrical energy in response to movement of the pistons.

22. The engine and generator of Claim 21 wherein the non-combustible gas is selected from the group consisting of air, inert gas, and combinations thereof.

23. The engine and generator of Claim 21 wherein the means for igniting the gas in each of the chambers includes means for applying RF energy to the chamber to ionize the gas and form a plasma, and means for igniting the plasma.

24. The engine and generator of Claim 23 including switches responsive to the positions of the pistons for igniting the plasma when the pistons are at or near the minimum volume positions.

25. The engine and generator of Claim 23 including electrodes in the chambers for heating the ionized gas.

26. The engine and generator of Claim 21 including a valve communicating with the chamber for replenishing the gas in the chamber.

27. The engine and generator of Claim 26 wherein the valve is a check valve which admits additional gas into the chamber when the pressure in the chamber drops below a predetermined level.